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EXAMINER	
SINGH, DALZID E	
ART UNIT	**PAPER NUMBER**
2633	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	10/008,507	COLLINGS ET AL.
	Examiner	Art Unit
	Dalzid Singh	2633

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *08 November 2001*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-31* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-31* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *08 November 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

1. Claim 31 is objected to because of the following informalities:

Claim 31 ends with "; and" and does not end with a period. It appears that the claim comprise of additional limitations. In line 10 of claim 1, a period has been placed after "...M" and not at the end of the claim. For the purpose of examination, limitation as listed in claim 31 will be considered. Appropriate correction is required.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claim 29 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 29 recites the limitation "said third node" in lines 5 and 17. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 1-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hutchison et al (US Patent No. 6,728,486).

Regarding claim 1, Hutchison et al disclose optical communication system, as shown in Fig. 13A) comprising:

a series connection of elements E_i, i=1,2, ...N, (232 and 234 are in series connection) and where N is greater than 1, forming a first optical path, where each of said elements E_i injects an optical signal of band λ_i (λ_{13} or λ_{15}), and where λ_i is disjoint from λ_j for all $i \neq j$; and,

a series connection of elements F_i, i=1,2, ... N, (236 and 238 are in series connection) forming a second optical path, where each of said elements F_i extracts an optical signal of band λ_l (λ_{13} or λ_{15}).

Hutchison et al differ from the claimed invention in that Hutchison et al do not specifically disclose a plurality of transmitters T_i, i=1,2, ...N, coupled to said elements E_i on a one to one basis and a plurality of a receivers R_i, i=1,2, ...N, coupled to said elements F_i on a one to one basis. However, as shown in Fig. 13A, Hutchison et al show elements (232 and 234) receives and injects optical signals and elements (236 and 238) extract optical signal, therefore it would have been obvious that there exist plurality of transmitters coupled to each element (232 and 234), through lines 250 and 254 respectively, and plurality of receivers, coupled to each elements (236 and 238) through lines 248 and 252 respectively, in order to transmit optical signals to other nodes and receive optical signal from other nodes.

Regarding claim 2, as shown in Fig. 13A, Hutchison et al show said first optical path and said second optical path are physically separate paths.

Regarding claim 3, as shown in Fig. 13A, Hutchison et al show each of said bands, λ_i, is a narrow band that carries a single channel of communication (since Hutchison et al disclose communication system, therefore the optical signal carries communication channel; moreover, the communication system of Hutchison et al uses WDM technique therefore, it would have been obvious that the bands (λ_{13} or λ_{15}) is narrow band in order to prevent crosstalk between the multiplex optical signals).

Regarding claim 4, as shown in Fig. 13A, Hutchison et al show that each of said bands, λ_i (λ_{13} or λ_{15}) is substantially a single wavelength.

Regarding claim 5, as shown in Fig. 13A, Hutchison et al show different bands, λ_i (λ_{13} or λ_{15}) and differ from the claimed invention in that Hutchison et al do not specifically disclose that at least one of said elements E_k, that injects band λ_k, carries a plurality of independent channels of communication. However, since the system of Hutchison is used in communication, therefore it would have been obvious that the element is able to carries plurality of independent channels of communication in order to interface with various other nodes.

Regarding claim 6, as shown in Fig. 13A, Hutchison et al show each of said bands, λ_i, comprises a plurality of narrow bands centered about wavelengths λ_j, j=1, 2, ... M, where M is an integer greater than 1, and each of said narrow bands constitutes an information channel (since Hutchison et al disclose communication system, therefore the optical signal carries communication channel; moreover, the communication system

of Hutchison et al uses WDM technique therefore, it would have been obvious that the bands (λ_{13} or λ_{15}) is narrow band in order to prevent crosstalk between the multiplex optical signals in order to prevent crosstalk between optical signals; it is well known that the band is centered around wavelength).

Regarding claim 7, as shown in Fig. 13A, Hutchison et al show that the narrow bands are composed of essentially a single wavelength, where wavelength λ_j is different from λ_k for all $j \neq k$.

Regarding claim 8, as discussed above, Hutchison et al disclose transmitters, T_k, includes an optical multiplexer that combines optical signals, each of said signals constituting one channel of communication, to form an optical signal of band λ_k (in col. 8, lines 37-61, Hutchison et al disclose the use of wavelength division multiplexing (WDM), therefore it would have been obvious that there exist multiplexer to multiplex the plurality of optical signal from the transmitters).

Regarding claim 9, as discussed above, Hutchison et al disclose multiplexer and differ from the claimed invention in that Hutchison et al do not specifically disclose that the multiplexer is a multi-level multiplexer. However, it is well known that plurality of multiplexer can be couple together to form cascaded multiplexer, therefore, it would have been obvious to form a multi-level multiplexer by cascading the multiplexer in order to combine optical signal of different data rates.

Regarding claim 10, as shown in Fig. 13A, Hutchison et al show that a collection of elements that includes element E_i (234) and element F_i (238) are housed in a single equipment module M_i (230) resulting in said node comprising a plurality of modules M_i,

$i=1, 2, \ldots N$ (the plurality of modules or nodes, shown in Fig. 10, are coupled in a ring) that are serially connected. Hutchison et al differ from the claimed invention in that Hutchison et al do not specifically disclose the transmitter T_i and receiver R_i are housed in the single equipment module. However, it would have been obvious to an artisan of ordinary skill in the art at the time the invention was made to housed the transmitter and receiver in the same equipment module. One of ordinary skill in the art would have been motivated to do this in order to reduce transmission line loss due to long transmission lines.

Regarding claim 11, as discussed above, Hutchison et al show a collection of elements that includes element E_i, element F_i are housed in a single equipment module M_i, resulting in said node comprising a serially interconnected set of modules M_i, $i=1, 2, \ldots N$, with said interconnected set having

an add-in node input port (244) that is connected to module M_i (the add in port is coupled to lines (244)),

a drop-out node output port (246) that is connected to module M_i (the drop-out port is coupled to lines (246)),

an add-in node output port (240) that is connected to module M_N (the add-in output port is coupled to lines (240)), and

a drop-out node input port (242) that is connected to module M_N (the drop-out input port is coupled to lines (242)).

Hutchison et al differ from the claimed invention in that Hutchison et al do not specifically disclose the transmitter T_i and receiver R_i are housed in the single

equipment module. However, it would have been obvious to an artisan of ordinary skill in the art at the time the invention was made to housed the transmitter and receiver in the same equipment module. One of ordinary skill in the art would have been motivated to do this in order to reduce transmission line loss.

Regarding claim 12, as shown in Fig. 13A, Hutchison et al shows that said add-in node input port (244), and said drop-out node output port (246) are in close physical proximity to each other, and said add-in node output port (240), and said drop-out node input port (242) are in close physical proximity to each other.

Regarding claim 13, as shown in Fig. 13A, Hutchison et al disclose that said elements E_i (234) and F_i (238), i=1,2, ...N, are housed in a single equipment module (230) that includes ports P_i, i=1, 2, ... N, (ports of lines 240, 242, 244 and 246) with each P_k being coupled to elements E_k and F_k (other elements comprising of plurality of ports are located at different location in the ring, see Fig. 10), and transmitter T_i and receiver R_i form a conversion module C_i that is outside said single equipment module, thereby resulting in a plurality of conversion modules C_i, i=1, 2, ... N, with each conversion module C_k being coupled to port P_k, for all values of k=1, 2, ... N (it would have been obvious to provide a transmitter and receiver to transmit and received the signal as discussed in claim 1).

Regarding claim 14, as shown in Fig. 13A, Hutchison et al show each element E_i (234) has an input port (244) and an output port (240), each element E_i, has its output port connected to input port of element E_{i+1}, the input port of element E_i , forms an add-in node input port, and the input port of element E_N forms an add-in node output port (as

shown in Fig. 10, Hutchison show plurality of elements or nodes coupled in a ring network, it would have been obvious that each element has ports to receive and transmit signal from other elements), and

each element F_i (238) has an input port (242) and an output port (246), each element F_i has its output port connected to input port of element F_{i-1}, the input port of element F_N forms a drop-out node input port, and the input port of element F_1, forms a drop-out node output port (as shown in Fig. 10, Hutchison show plurality of elements or nodes coupled in a ring network, it would have been obvious that each element has ports to receive and transmit signal from other elements).

Regarding claim 15, Hutchison et al disclose communication system comprising:

a second node, in a second communication place that is remote from said first communication place (since the communication system comprises of plurality of nodes, details of such nodes are shown in Fig. 13A, which can be considered as a second node) the second node, comprising

a series connection of elements E'_k (234 and 232), k=1,2, ...N', where N' is greater than 1, forming a first optical path within said second node, where each of said elements E_i injects an optical signal of band λ_k , and where λ_k is disjoint from λ_m for all k $\neq$ m;

a series connection of elements F'_k (236 and 238), k=1,2, ...N', forming a second optical path within said second node, where each of said elements F'_i extracts an optical signal of band $\lambda_{k'}$; and

a bi-directional optical path that interconnects said node in said first communication place with said second node in said second communication place (as shown in Fig. 10, Hutchison show a bi-directional optical path).

Hutchison et al differ from the claimed invention in that Hutchison et al do not specifically disclose a plurality of transmitters T_i, i=1,2, ...N, coupled to said elements E_i on a one to one basis and a plurality of a receivers R_i, i=1,2, ...N, coupled to said elements F_i on a one to one basis. However, as shown in Fig. 13A, Hutchison et al show elements (232 and 234) receives and injects optical signals and elements (236 and 238) extract optical signal, therefore it would have been obvious that there exist plurality of transmitters coupled to each element (232 and 234), through lines 250 and 254 respectively, and plurality of receivers, coupled to each elements (236 and 238) through lines 248 and 252 respectively, in order to transmit optical signals to other nodes and receive optical signal from other nodes.

Regarding claim 16, as shown in Fig. 13A, Hutchison et al show that each bandwidth λ_k in said node in said second communication place corresponds, and is substantially identical, to one bandwidth λ_i is said first communication place (Hutchison et al show plurality of optical signals use in the communication system).

Regarding claim 17, as shown in Fig. 10, Hutchison et al show plurality of nodes, such as a third node, in a third communication place that is remote from both said first communication place and said second communication place, (since the communication system comprises of plurality of nodes, details of such nodes are shown in Fig. 13A, which can be considered as a third node) third node comprising:

a series connection of elements E''_n (232 and 234), n=1,2, ...N, where N" is greater than 1, forming a first optical path in said third node, where each of said elements E'_n, injects an optical signal of band λ_n and where λ_n, is disjoint from λ_o for all $n \neq o$;

a series connection of elements F''_n (236 and 238), n=1,2,...N', forming a first optical path, where each of said elements F''_n extracts an optical signal of band $\lambda_{n'}$; and

a bi-directional optical path that interconnects said second node in said second communication place with said third node in said third communication place (as shown in Fig. 10, Hutchison show a bi-directional optical path).

Hutchison et al differ from the claimed invention in that Hutchison et al do not specifically disclose a plurality of transmitters T_i, i=1,2, ...N, coupled to said elements E_i on a one to one basis and a plurality of a receivers R_i, i=1,2, ...N, coupled to said elements F_i on a one to one basis. However, as shown in Fig. 13A, Hutchison et al show elements (232 and 234) receives and injects optical signals and elements (236 and 238) extract optical signal, therefore it would have been obvious that there exist plurality of transmitters coupled to each element (232 and 234), through lines 250 and 254 respectively, and plurality of receivers, coupled to each elements (236 and 238) through lines 248 and 252 respectively, in order to transmit optical signals to other nodes and receive optical signal from other nodes.

Regarding claim 18, as shown in Fig. 13A, Hutchison et al show plurality of bands where at least one band in said node in said first communication place, λ_i (λ_{13}) has no matching band λ_k (λ_{15}) in said second communication place.

Regarding claim 19, as shown in Fig. 13A, Hutchison et al show plurality of bands where at least one band in said node in said first communication place, λ_i (λ_{13}), has a matching band λ_k (λ_{13}) in said second communication place.

Regarding claim 20, as shown in Fig. 10, Hutchison et al show plurality of nodes, such as a third node, including a third communication place that is remote from both said first communication place and said second communication place, said third communication place comprising:

a third node serially connected to a fourth node (since the communication system comprises of plurality of nodes, details of such nodes are shown in Fig. 13A, which can be considered as a third node), where said third node comprises:

a series connection of elements E''_n (232 and 234), n=1,2, ...N, where N" is greater than 1, forming a first optical path in said third node, where each of said elements E'_n, injects an optical signal of band λ_n and where λ_n, is disjoint from λ_o for all $n \neq o$; and,

a series connection of elements F''_n (236 and 238), n=1,2,...N', forming a first optical path, where each of said elements F''_n extracts an optical signal of band $\lambda_{n'}$.

Hutchison et al differ from the claimed invention in that Hutchison et al do not specifically disclose a plurality of transmitters T_i, i=1,2, ...N, coupled to said elements E_i on a one to one basis and a plurality of a receivers R_i, i=1,2, ...N, coupled to said elements F_i on a one to one basis. However, as shown in Fig. 13A, Hutchison et al show elements (232 and 234) receives and injects optical signals and elements (236 and 238) extract optical signal, therefore it would have been obvious that there exist

plurality of transmitters coupled to each element (232 and 234), through lines 250 and 254 respectively, and plurality of receivers, coupled to each elements (236 and 238) through lines 248 and 252 respectively, in order to transmit optical signals to other nodes and receive optical signal from other nodes.

said fourth node (since the communication system comprises of plurality of nodes, details of such nodes are shown in Fig. 13A, which can be considered as a fourth node) comprises

a series connection of elements E'''_p (232 and 234), k=1,2, ...N", where N''' is greater than 1, forming a first optical path in said third node, where each of said elements E'''_p, injects an optical signal of band λ_p and where λ_p, is disjoint from λ_q for all $p \neq q$;

a series connection of elements F'''_p (236 and 238), n=1,2,...N''', forming a first optical path, where each of said elements F'''_p extracts an optical signal of band λ_p;

Hutchison et al differ from the claimed invention in that Hutchison et al do not specifically disclose a plurality of transmitters T_i, i=1,2, ...N, coupled to said elements E_i on a one to one basis and a plurality of a receivers R_i, i=1,2, ...N, coupled to said elements F_i on a one to one basis. However, as shown in Fig. 13A, Hutchison et al show elements (232 and 234) receives and injects optical signals and elements (236 and 238) extract optical signal, therefore it would have been obvious that there exist plurality of transmitters coupled to each element (232 and 234), through lines 250 and 254 respectively, and plurality of receivers, coupled to each elements (236 and 238)

through lines 248 and 252 respectively, in order to transmit optical signals to other nodes and receive optical signal from other nodes.

Regarding claim 21, at least one of said bands λ_i is equal to one of said bands λ_n (as shown in Fig. 13A, Hutchison et al show plurality of wavelengths, therefore it would have been obvious to provide equal wavelength).

Regarding claim 22, at least one of said bands λ_i is equal to one of said bands λ_n and also to one of said bands λ_p (as shown in Fig. 13A, Hutchison et al show plurality of wavelengths, therefore it would have been obvious to provide equal wavelength).

Regarding claim 23, as shown in Fig. 10, Hutchison et al disclose optical communication comprising:

a first node (100 on the left side) in a first location,

a second node (100 on the right side) in a second location that is remote from said first location (any node that is ; and

a bi-directional optical connection (102) between said first node and said second node.

Regarding claim 24, as shown in Fig. 13A, Hutchison et al show the optical connection comprises an optical path from said add-in node output port of said first node to said drop-out node input port of said second node, and an optical path from said add-in node output port of said second node to said drop-out node input port of said first node (Fig. 10 shows that the nodes are coupled to each other, therefore the ports of different nodes are also coupled to each other).

Regarding claim 30, as shown in Fig. 13A, Hutchison et al show plurality of nodes interconnected to form a ring.

Regarding claim 25, Hutchison et al disclose optical communication system, as shown in Fig. 13A, comprising:

a first series connection of N elements (232 and 234 are in series connection), forming a first optical path, where each of the elements in said first series injects an optical signal of a preselected band of wavelengths (λ_{13} and λ_{15}), and where bands of wavelengths of the different elements in said first series are disjoint from each other; and,

a second series connection of N elements (236 and 238 are in series connection), forming a second optical path that is disjoint from said first optical path, where each of the elements in said second series extracts an optical signal of a preselected band of wavelengths (λ_{13} and λ_{15}), and where bands of wavelengths of the different elements in said second series are the same as the bands of wavelengths of the different elements in said first series.

Hutchison et al differ from the claimed invention in that Hutchison et al do not specifically disclose a plurality of transmitters coupled to said N elements and a plurality of a receivers coupled to said elements N. However, as shown in Fig. 13A, Hutchison et al show elements (232 and 234) receives and injects optical signals and elements (236 and 238) extract optical signal, therefore it would have been obvious that there exist plurality of transmitters coupled to each element (232 and 234), through lines 250 and 254 respectively, and plurality of receivers, coupled to each elements (236 and

238) through lines 248 and 252 respectively, in order to transmit optical signals to other nodes and receive optical signal from other nodes.

Regarding claim 26, Hutchison et al disclose optical communication system comprising of plurality of nodes, as shown in Fig. 10A, in which the nodes (modules) are shown in detail of Fig. 13A, comprising:

A first module (a first one of the nodes) that includes

a) an add-in port (correspond to line 244) that leads to a set of elements that add an optical signal of a first wavelength (λ_{13}),

b) an add-out port (correspond to line 240) that outputs an optical signal from said set of

elements that add an optical signal,

c) a drop-in port (correspond to line 242)that leads to a set of elements that extract an optical signal of said first wavelength (λ_{13}), and

d) a drop-out port (correspond to line 246) that outputs an optical signal from said set of elements that extract an optical signal;

A second module (located at different location in the ring which has the function as shown in Fig. 13A) that includes

a) an add-in port (correspond to line 244) that leads to a set of elements that add an optical signal of a second wavelength (λ_{15}),

b) an add-out port (correspond to line 240) that outputs an optical signal from said set of elements that add an optical signal,

c) a drop-in port (correspond to line 242) that leads to a set of elements that extract an optical signal of said second wavelength (λ_{15}), and

d) a drop-out port (correspond to line 243) that outputs an optical signal from said set of elements that extract an optical signal; and

connection elements that optically connect the add-out port of said first module to the add-in port of said second module, and the drop out port of said second module is optically connected to the drop-in of said first module (the connection element is the transmission line that connect first different nodes as shown in Fig. 10).

Hutchison et al show plurality of nodes as shown in Fig. 10 and differ from the claimed invention in that Hutchison et al do not specifically disclose detail of all the same module or nodes and only show detail of one node or module as in Fig. 13A. However, since there are plurality of modules or nodes in the ring, therefore it would have been obvious to considered a node at one location as a first node (module) and a node at different location as a second node (module). Moreover, since the module or nodes are able to transmit and receive signal, therefore it would have been obvious that the nodes comprises of input and output ports to receive and transmit signal.

Regarding claim 27, in view of the rejection of claim 27, nodes at other location of the ring network as shown in Fig. 10, can been considered as third or fourth modules comprising:

A third module that includes

a) an add-in port (correspond to line 244) that leads to a set of elements that add an optical signal of a second wavelength (λ_{15}),

b) an add-out port (correspond to line 240) that outputs an optical signal from said set of elements that add an optical signal,

c) a drop-in port (correspond to line 242) that leads to a set of elements that extract an optical signal of said second wavelength (λ_{15}), and

d) a drop-out port (correspond to line 246) that outputs an optical signal from said set of elements that extract an optical signal;

A fourth module that includes

a) an add-in port (correspond to line 244) that leads to a set of elements that add an optical signal of a first wavelength (λ_{13}),

b) an add-out port (correspond to line 240) that outputs an optical signal from said set of elements that add an optical signal,

c) a drop-in port (correspond to line 242) that leads to, a set of elements that extract an optical signal of said first wavelength (λ_{15}), and

d) a drop-out port (correspond to line 246) that outputs an optical signal from said set of elements that extract an optical signal;

connection elements that optically connect the add-out port of said third module to the add-in port of said fourth module, and the drop out port of said fourth module is optically connected to the drop-in of said third module (as shown in Fig. 10, the elements or nodes are connected in a ring); and

connection elements that optically connect the drop-out port of said third module to the add-in port of said fourth module, and the drop-out port of said fourth module is

optically connected to the add-in of said third module (as shown in Fig. 10, the elements or nodes are connected in a ring).

Regarding claim 28, in view of the rejection of claim 27, nodes at other location of the ring network as shown in Fig. 10, can been considered as third or fourth modules comprising:

A third module that includes

a) an add-in port (correspond to line 244) that leads to a set of elements that add an optical signal of a first wavelength (λ_{13}),

b) an add-out port (correspond to line 240) that outputs an optical signal from said set of elements that add an optical signal,

c) a drop-in port (correspond to line 242) that leads to a set of elements that extract an optical signal of said first wavelength (λ_{13}), and

d) a drop-out port (correspond to line 246) that outputs an optical signal from said set of elements that extract an optical signal;

A fourth module that includes

a) an add-in port (correspond to line 244) that leads to a set of elements that add an optical signal of a second wavelength (λ_{15}),

b) an add-out port (correspond to line 240) that outputs an optical signal from said set of elements that add an optical signal,

c) a drop-in port (correspond to line 242) that leads to a set of elements that extract an optical signal of said second wavelength (λ_{15}), and

d) a drop-out port (correspond to line 246) that outputs an optical signal from said set of elements that extract an optical signal;

connection elements that optically connect the add-out port of said third module to the add-in port of said fourth module, and the drop out port of said fourth module is optically connected to the drop-in of said third module (as shown in Fig. 10, the elements or nodes are connected in a ring); and

connection elements that optically connect the drop-out port of said third module to the add-in port of said fourth module, and the drop-out port of said fourth module is optically connected to the add-in of said third module (as shown in Fig. 10, the elements or nodes are connected in a ring).

Regarding claim 29 (as far as understood), Hutchison et al disclose optical communication system comprising of plurality of nodes, as shown in Fig. 10A, in which the nodes (modules) are shown in detail of Fig. 13A comprising:

a first sub-node serially connected to a second sub-node, where said first sub-node comprises (details of the nodes are shown in Fig. 13A)

a series connection of elements E''_n, k=1,2, ...N (232 and 234), where N" is greater than 1, forming a first optical path in said third node, where each of said elements E'_n, injects an optical signal of band λ_n (λ_{15}) and where λ_n, is disjoint from λ_o for all $n \neq o$;

a series connection of elements F''_n, n=1,2,...N' (236 and 238), forming a first optical path, where each of said elements F''_n extracts an optical signal of band $\lambda_{n'}$ (λ_{13}); and

said fourth node comprises

a series connection of elements E'''_p, k=1,2, ...N" (232 and 234), where N'" is greater than 1, forming a first optical path in said third node, where each of said elements E'''_p, injects an optical signal of band λ_p (λ_{15}) and where λ_p, is disjoint from λ_q for all $p \neq q$;

a series connection of elements F'''_p, n=1,2,...N'" (236 and 238), forming a first optical path, where each of said elements F'''_p extracts an optical signal of band λ_p; and where at least one of said bands λ_n is equal to one of said bands λ_p (as shown in Fig. 13A, Hutchison et al show plurality of band that are equal).

Hutchison et al differ from the claimed invention in that Hutchison et al do not specifically disclose a plurality of transmitters coupled to said elements E_i on a one to one basis and a plurality of a receivers coupled to said elements F_i on a one to one basis. However, as shown in Fig. 13A, Hutchison et al show elements (232 and 234) receives and injects optical signals and elements (236 and 238) extract optical signal, therefore it would have been obvious that there exist plurality of transmitters coupled to each element (232 and 234), through lines 250 and 254 respectively, and plurality of receivers, coupled to each elements (236 and 238) through lines 248 and 252 respectively, in order to transmit optical signals to other nodes and receive optical signal from other nodes.

Regarding claim 31, Hutchison et al disclose optical communication system comprising of plurality of nodes, as shown in Fig. 10A, in which the nodes (modules) are shown in detail of Fig. 13A comprising:

a first optical path composed of a series connection of elements E_i, i=1,2, ...N (232 and 234), where N is greater than 1, where each of said elements E_i injects an optical signal of band λ_i (λ_{15}), and where λ_i is disjoint from λ_j for all $i \neq j$, followed by a series connection of elements F_j, i=1,2, ... N (236 and 238), where each of said elements F_i extracts an optical signal of band λ_j (λ_{13}) and where at least one λ_i is equal to λ_j; and

a second optical path, disjoint from said first optical path, composed of a series connection of elements F_i, i=1,2, ... N, followed by series connection of elements E_j, i=1,2, ...M (the second optical path can be shown in Fig. 16A, comprise of series connection of elements (322, 324, 326 and 328));

Hutchison et al differ from the claimed invention in that Hutchison et al do not specifically disclose a plurality of transmitters coupled to said elements E_i on a one to one basis and a plurality of a receivers coupled to said elements F_i on a one to one basis. However, as shown in Fig. 13A, Hutchison et al show elements (232 and 234) receives and injects optical signals and elements (236 and 238) extract optical signal, therefore it would have been obvious that there exist plurality of transmitters coupled to each element (232 and 234), through lines 250 and 254 respectively, and plurality of receivers, coupled to each elements (236 and 238) through lines 248 and 252 respectively, in order to transmit optical signals to other nodes and receive optical signal from other nodes.

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Sundelin (US Patent No. 6,091,869) is cited to show low loss, optical add/drop WDM node.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dalzid Singh whose telephone number is (571) 272-3029. The examiner can normally be reached on Mon-Fri 9am - 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on (571) 272--3022. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

DS
April 6, 2005

M. R. Sedighian
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PRIMARY EXAMINER